

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/081,046	GILL, HARDAYAL SINGH	
	<b>Examiner</b>	<b>Art Unit</b>	
	Christopher R. Magee	2653	

**– The MAILING DATE of this communication appears on the cover sheet with the correspondence address–**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Appeal Brief filed on 2/22/2005.
2. ☒ The allowed claim(s) is/are 1-23.
3. ☒ The drawings filed on 2/20/2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

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| <ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br/>Paper No./Mail Date _____</li> <li>4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br/>of Biological Material</li> </ol> | <ol style="list-style-type: none"> <li>5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</li> <li>6. <input type="checkbox"/> Interview Summary (PTO-413),<br/>Paper No./Mail Date _____</li> <li>7. <input type="checkbox"/> Examiner's Amendment/Comment</li> <li>8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance</li> <li>9. <input type="checkbox"/> Other _____</li> </ol> |
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## DETAILED ACTION

### *Response to Appeal Brief*

1. Applicant's arguments on pages 7-12 of Appeal Brief, filed 02/22/2005, with respect to Hasegawa et al. (hereinafter Hasegawa) (US 6,496,338) and/or Gill (US 6,052,263), have been fully considered and are persuasive. The finality of the last Office Action, dated 03/24/2004, has been withdrawn.

2. All relevant objections and rejections are withdrawn as being satisfied

### *Reasons for Allowance*

3. Claims 1-23 are allowed.

The following is an examiner's statement of reasons for allowance:

This application is for a MAGNETORESISTANCE SENSOR HAVING AN ANTIFERROMAGNETIC PINNING LAYER WITH BOTH SURFACES PINNING FERROMAGNETIC BIAS LAYERS.

- **Claims 1, 7 and 18** specify a magnetoresistance sensor structure, which requires:

*"an upper ferromagnetic layer overlying and contacting at least a portion of the upper antiferromagnetic layer on a contact face lying parallel to the sensor surface plane, so that the upper antiferromagnetic layer lies between the upper ferromagnetic layer and the free layer."*

Hasegawa '338 teaches the ferromagnetic layer [47] on the antiferromagnetic layers [46] are provided so that the ends thereof cover the sides of the free ferromagnetic layer [44] to about half of the thickness thereof (col. 11, lines 12-15 and Fig. 3). The ferromagnetic layer [47] and the antiferromagnetic layer [46] fail to cover the free ferromagnetic layer on a contact surface

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that is parallel to the sensor surface plane but rather on a plane more nearly perpendicular to the sensor surface plane.

Therefore, these features, in combination with other features of claims 1, 7 and 18 are not anticipated by, nor made obvious over, the closest prior art of record of Hasegawa '338.

- **Claims 6 and 17** specify a magnetoresistance sensor structure, which requires:

*"an upper antiferromagnetic layer overlying substantially all the free layer" and "a cap layer overlying the upper ferromagnetic layer."*

Hasegawa '338 shows an upper antiferromagnetic layer [46] overlying a portion of the free layer [44] but does not teach or suggest an upper antiferromagnetic layer overlying substantially all the free layer and a cap layer overlying the upper ferromagnetic layer as claimed in the present invention.

- **Claim 13** specifies a magnetoresistance sensor structure, which requires:

*"an upper ferromagnetic layer overlying a first portion of the free layer that is less than all of the free layer and contacting the upper antiferromagnetic layer on a contact face lying parallel to the sensor surface plane, so that the upper antiferromagnetic layer lies between the upper ferromagnetic layer and the free layer;" and "a cap layer overlying the upper ferromagnetic layer."*

Hasegawa '338 teaches the ferromagnetic layer [47] on the antiferromagnetic layers [46] are provided so that the ends thereof cover the sides of the free ferromagnetic layer [44] to about half of the thickness thereof (col. 11, lines 12-15 and Fig. 3). The ferromagnetic layer [47] and the antiferromagnetic layer [46] fail to cover the free ferromagnetic layer on a contact surface that is parallel to the sensor surface plane but rather on a plane more nearly

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perpendicular to the sensor surface plane. Further, Hasegawa '338 does not teach or suggest a cap layer overlying the upper ferromagnetic layer as claimed in the present invention.

Therefore, these features, in combination with other features of claim 13 are not anticipated by, nor made obvious over, the closest prior art of record of Hasegawa '338.

- **Claims 21-23** specify a magnetoresistance sensor structure, which requires:

*“an upper ferromagnetic layer overlying and contacting at least a portion of the upper antiferromagnetic layer on a contact face lying parallel to the sensor surface plane, so that the upper antiferromagnetic layer lies between the upper ferromagnetic layer and the free layer in a plane parallel to the sensor surface plane.”*

Hasegawa '338 teaches the ferromagnetic layer [47] on the antiferromagnetic layers [46] are provided so that the ends thereof cover the sides of the free ferromagnetic layer [44] to about half of the thickness thereof (col. 11, lines 12-15 and Fig. 3). The ferromagnetic layer [47] and the antiferromagnetic layer [46] fail to cover the free ferromagnetic layer on a contact surface that is parallel to the sensor surface plane but rather on a plane more nearly perpendicular to the sensor surface plane.

Therefore, these features, in combination with other features of claims 21-23, are not anticipated by, nor made obvious over, the closest prior art of record of Hasegawa '338.

4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

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*Conclusion*

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Magee whose telephone number is (571) 272-7592. The examiner can normally be reached on M-F, 8: 00 am-5: 30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Christopher R. Magee

Patent Examiner

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May 30, 2005



WILLIAM KORZUCH

SUPERVISORY PATENT EXAMINER

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